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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/562,868

01/04/2007

Anne Durandau

283244US0PCT

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08/12/2010

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ALEXANDRIA, VA 22314

EXAMINER

GAMBETTA, KELLY M

ART UNIT

PAPER NUMBER

1715

NOTIFICATION DATE

DELIVERY MODE

08/12/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/562,868	Applicant(s) DURANDEAU ET AL.	
	Examiner KELLY GAMBETTA	Art Unit 1715	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-29 and 31 is/are pending in the application.
- 4a) Of the above claim(s) 11-28 and 31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-9 and 29 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection necessitated by amendments. The only argument that carries over to this rejection is that laconvengelo et al. does not teach atmospheric pressure deposition. However, in column 6 lines 1-12, laconvengelo discloses modifying chamber pressure and the pressure of the incoming reactants based upon reactant flow, in which the vacuum pump is used to maintain the flow through the chamber. As the claim does not specify whether or not the atmospheric pressure occurs anywhere in the deposition chamber (in other words, what could be the pressure of the precursor/plasma stream) or if it is the prevailing pressure throughout the deposition chamber, if the pressure of the plasma stream is modified to atmospheric pressure, this also meets the claim. In addition, one of ordinary skill in the art would recognize that the pressure of the reaction chamber, flow pressures, and the pressure during deposition and CVD reaction also depend upon many factors including the size of the substrate, the pressure of the gases, the presence of vacuum pumps and what type they are, the desired mean free path of the gas molecules and certain properties of the desired coating such as roughness and cleanliness. Therefore, one of ordinary skill in the art would modify the pressure by routine experimentation based upon these variables. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to include a pressure as atmospheric (as broadly claimed),

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since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

The 35 USC 112 2nd paragraph rejections of the previous office action have been withdrawn, except for that of claim 8, which is repeated below.

This application contains claims 11-28 and 31 drawn to an invention nonelected with traverse in the reply filed on 13 November 2009. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "one other type of mineral material". There is insufficient antecedent basis for this limitation in the claim. Claim 8, for the purposes of examination, will be interpreted to mean that the oxide is a mineral material made from a halide or metal organic precursor, as there is no claim that claim 8 depends on that includes another metal oxide mixed with another metal oxide. It is unclear whether this limitation means the oxides are mixed or that the metal halide is a mineral material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1-4, 7-9 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iacovangelo et al. (US 6890656).

As to claim 1, Iacovangelo et al. teaches a process for depositing, on a substrate, a coating based on semiconductor materials comprising a metal oxide, wherein the metal oxide initiates, under the effect of radiation of suitable wavelength, radical reactions causing the oxidation of organic substances so as to confer photocatalytic properties on said coating (column 1 lines 10-20 and 40-55, by definition of a photocatalytic coating given in the preamble), comprising depositing the photocatalytic coating by chemical vapor deposition in column 1 lines 10-20, for example. The deposition temperature is below 300 degrees Celsius in Table 2, for example. The gas mixture comprises an organometallic precursor or a metal halide of the metal oxide with the deposition being enhanced by a plasma source in column 6 lines 23-36 and the Examples.

Iacovangelo et al. does not teach atmospheric pressure deposition. However, in column 6 lines 1-12, Iacovangelo discloses modifying chamber pressure and the pressure of the incoming reactants based upon reactant flow, in which the vacuum pump is used to maintain the flow through the chamber. As the claim does not specify whether or not the atmospheric pressure occurs anywhere in the deposition chamber (in other words, what could be the pressure of the precursor/plasma stream) or if it is the prevailing pressure throughout the deposition chamber. If the pressure of the plasma stream is modified to atmospheric pressure, this also meets the claim as it only requires "an atmospheric pressure". In addition, one of ordinary skill in the art would recognize

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that the pressure of the reaction chamber, flow pressures, and the pressure during deposition and CVD reaction also depend upon many factors including the size of the substrate, the pressure of the gases, the presence of vacuum pumps and what type they are, the desired mean free path of the gas molecules and certain properties of the desired coating such as roughness and cleanliness. Therefore, one of ordinary skill in the art would modify the pressure by routine experimentation based upon these variables. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to include a pressure as atmospheric (as broadly claimed), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to claim 2, Iacovangelo et al. teaches depositing titanium oxide using carrier gas in a CVD process in column 5 lines 45-55. As shown in Figure 2, the carrier gas is injected into the chamber and then it becomes parallel with the precursor gas mixture in order to deposit on the substrate.

As to claim 3, Iacovangelo et al. teaches injecting an oxidizing agent into a mixture in the chamber with the titanium precursor in column 6 line 23-30, for example.

As to claim 4, some of the plasma gases contain reducing gases in column 5 lines 23-59.

As to claim 7, Iacovangelo et al. teaches depositing a layer that promotes adhesion of the photocatalytic layer to the substrate in column 2 lines 25-35.

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As to claim 8, Iacovangelo et al. teaches a metal halide as a precursor in column 6 lines 25-30.

As to claim 9, Iacovangelo et al. teaches that the deposition is enhanced by a plasma source in column 6 lines 25-30 and the abstract.

As to claim 29, the metal oxide is titanium in the abstract, for example.

Allowable Subject Matter

Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Iacovangelo et al. exclusively uses plasma treatment and a plasma stream to the substrate to deposit the titanium oxide coating. Therefore, the prior art, alone or in combination, does not meet this claim.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KELLY GAMBETTA whose telephone number is (571)272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kelly M Gambetta
Examiner
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/Timothy H Meeks/

Supervisory Patent Examiner, Art Unit 1715